

Developing and Evaluating Passage Structures for Adult Pacific lamprey at Bonneville Dam



National Oceanic
and Atmospheric
Administration

National Marine
Fisheries Service



University of Idaho



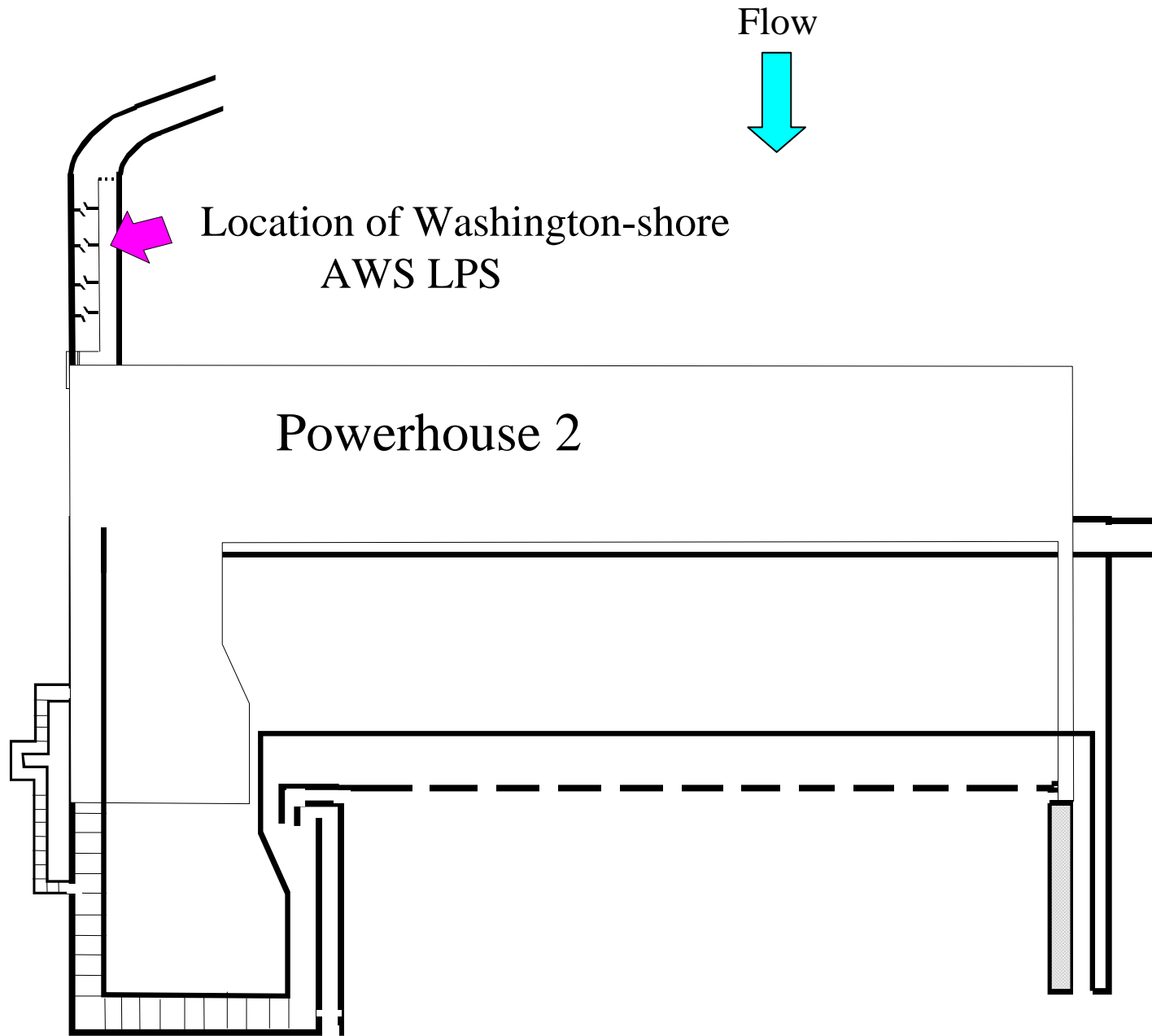


Lamprey Passage System (LPS)



Objectives

- Install Auxiliary Water Supply (AWS) LPS at the top of Washington-shore fishway
- Monitor lamprey use of Bradford Island and new Washington-shore Auxiliary Water Supply LPSs
- Assess lamprey use of an entrance LPS collector
- Monitor lamprey use of the Cascades Island fishway via HD-PIT detection





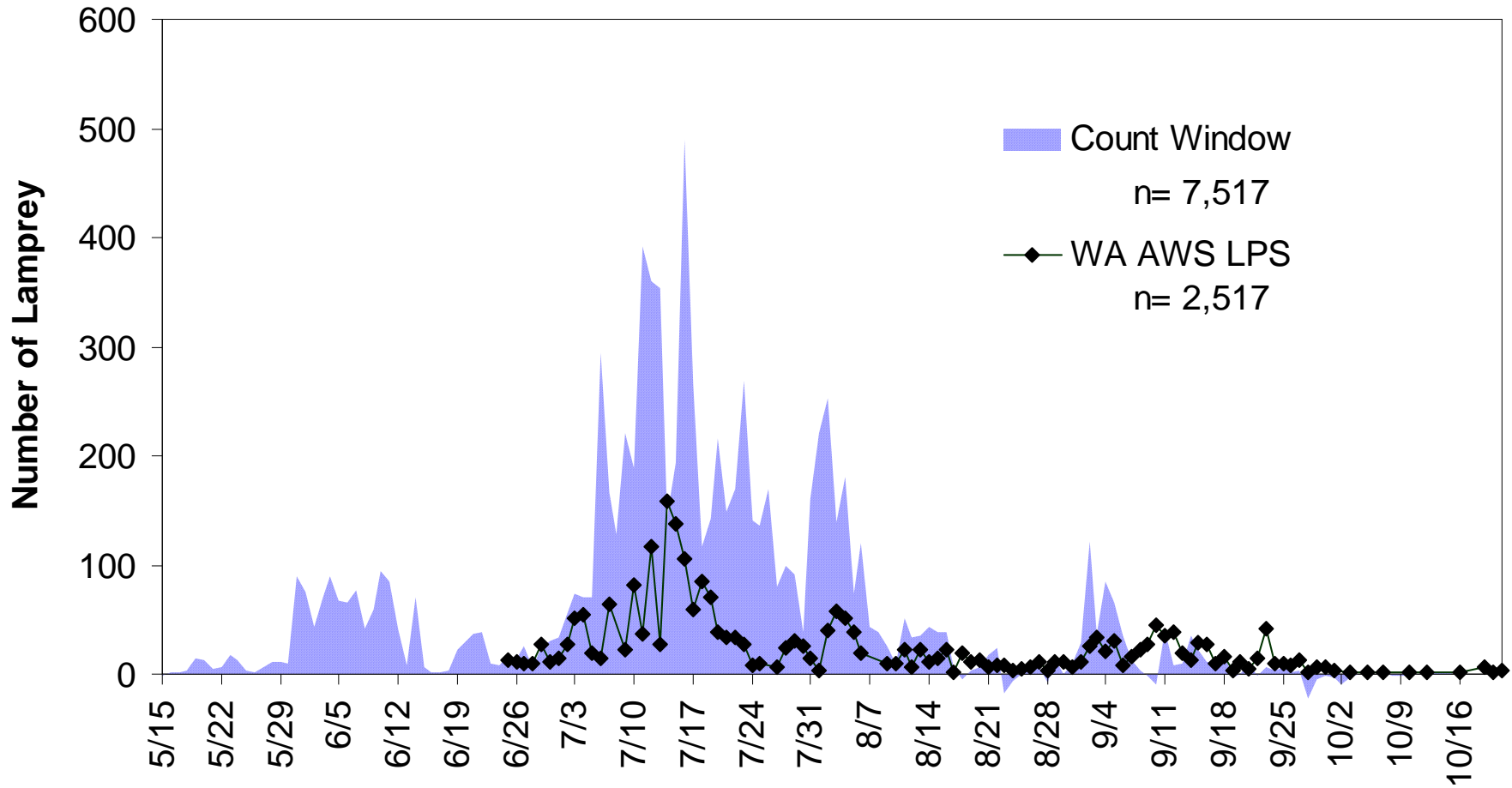
New Washington-shore AWS LPS Installation



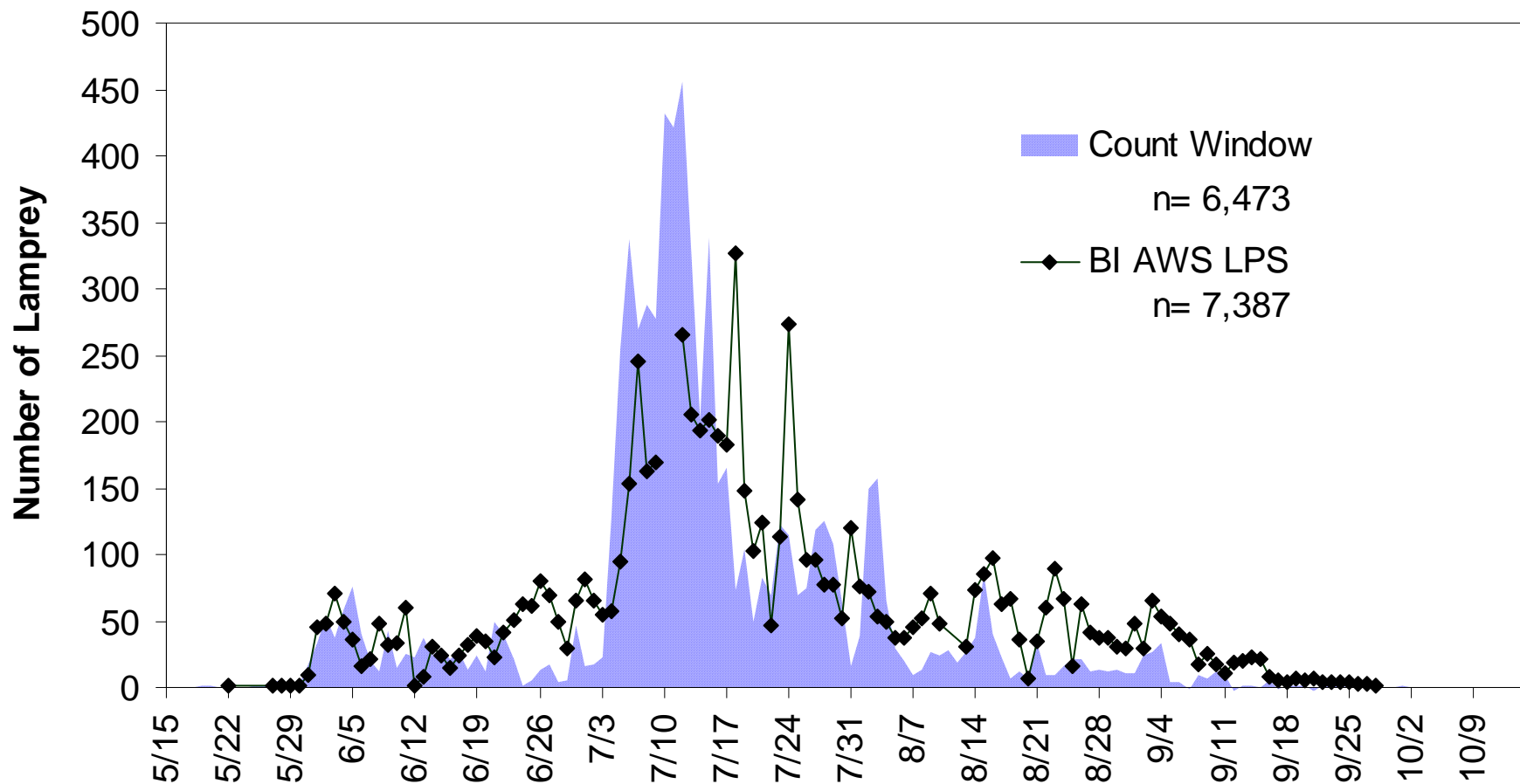




Washington-shore Fishway



Bradford Island Fishway



	Count Station Count	Estimated Total	BI AWS LPS Count	%
2004	11,971	35,913	7,490	21
2005	10,257	30,771	9,242	30
2006	14,862	44,586	14,975	34
2007	6,473	19,420	7,387	38





PIT tags (half-duplex)
3 x 31 mm

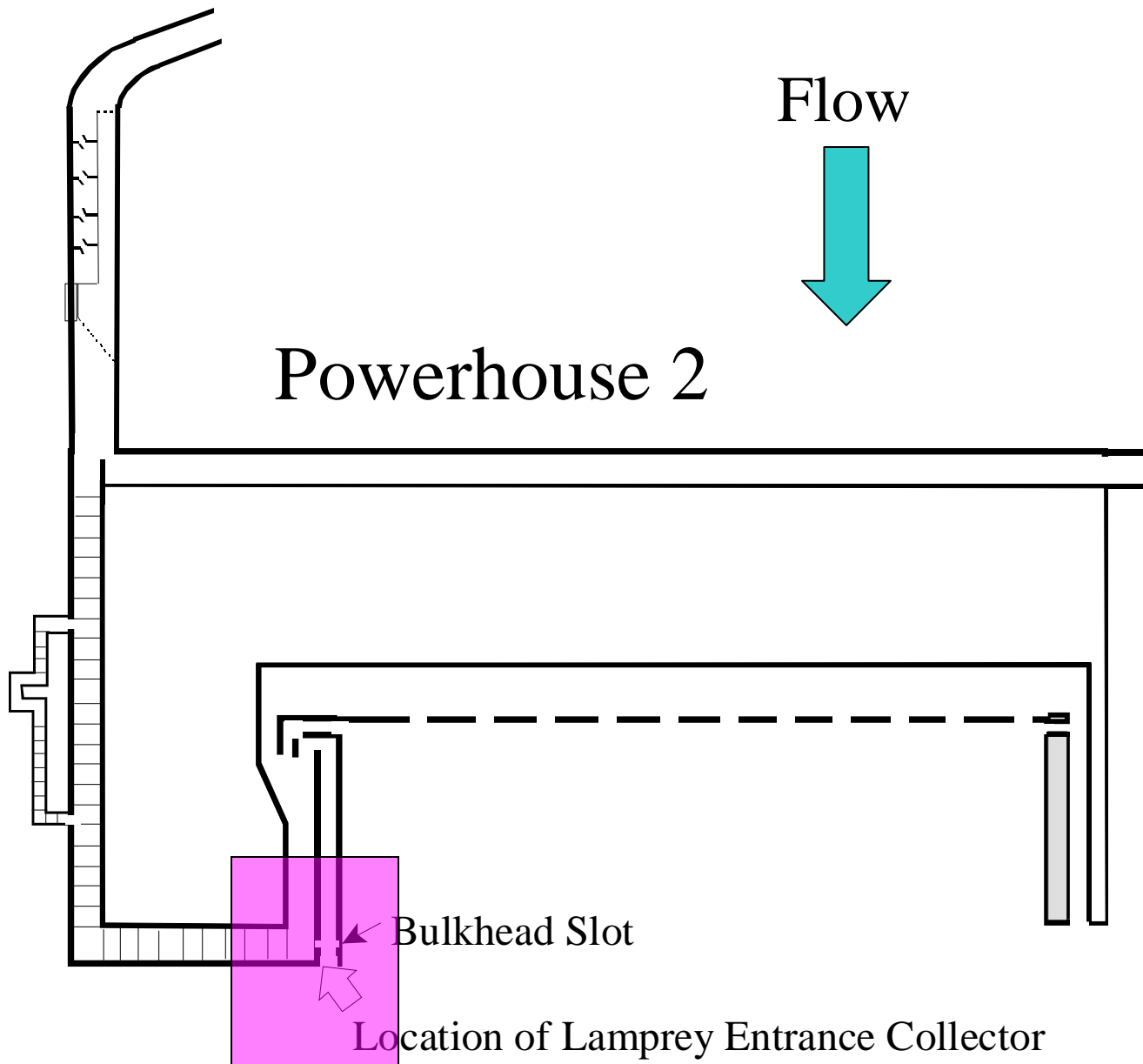
$n = 757$ releases below
Bonneville Dam

$n = 31$ at BI AWS LPS
(4%) and 3 from 2006
104 at Bradford exit
(14%) and 4 from 2006

$n = 26$ at WA AWS LPS
(3 %) and 2 from 2006
190 at WA exit
(26%) and 7 from 2006

AWS LPS Comparison

	BI	WA
Median Days to First LPS Detection	6.4 d (1.4 – 73.3)	14.4 d (2.4 – 95.5)
Median Time Detected in LPS	0.7 h (0.4 – 1.5)	0.5 h (0.3 – 16.5)
Median Rate in LPS	54.1 m h ⁻¹	52.5 m h ⁻¹
Passage Efficiency	91.2%	96.4%

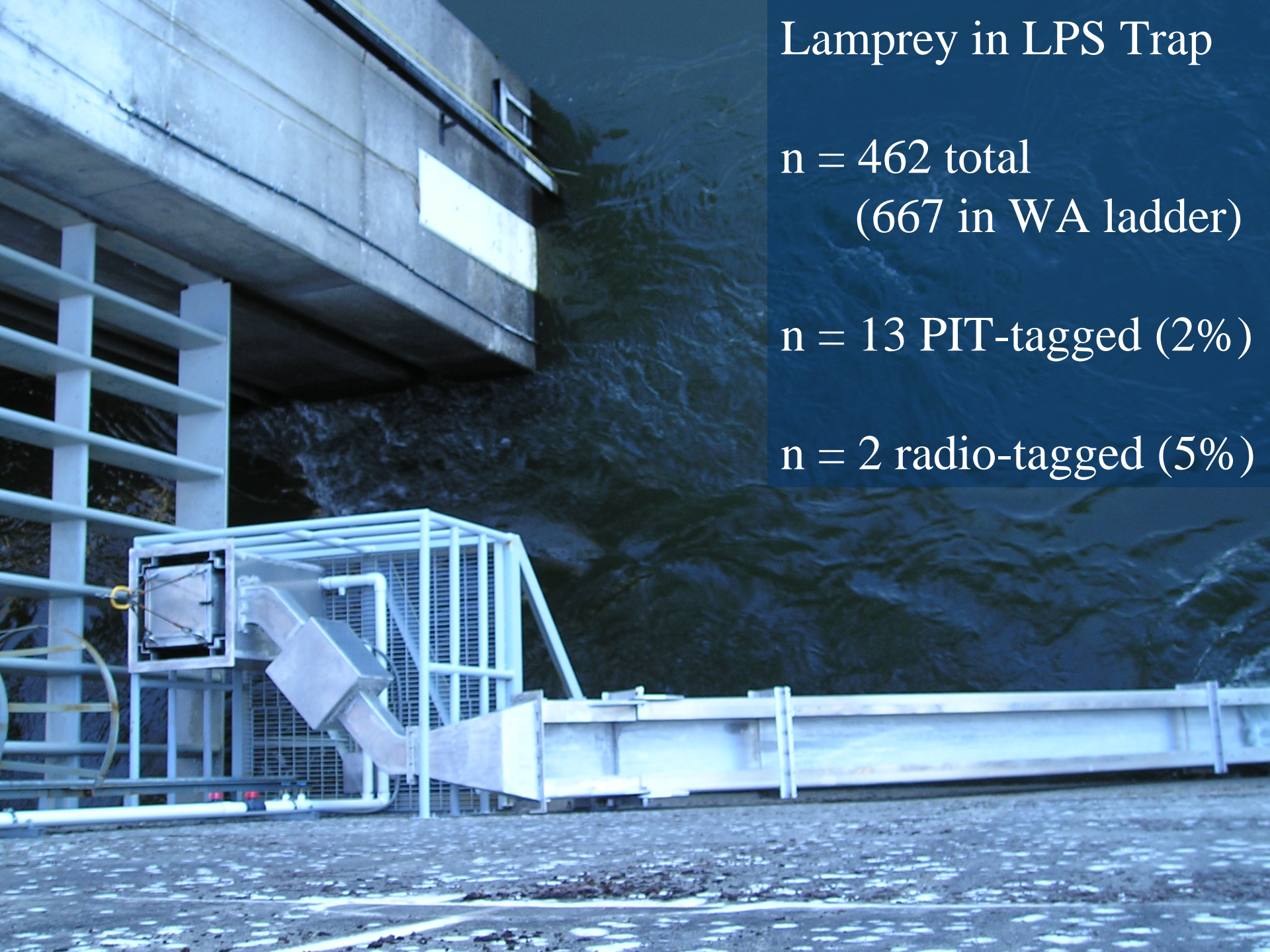


Lamprey in LPS Trap

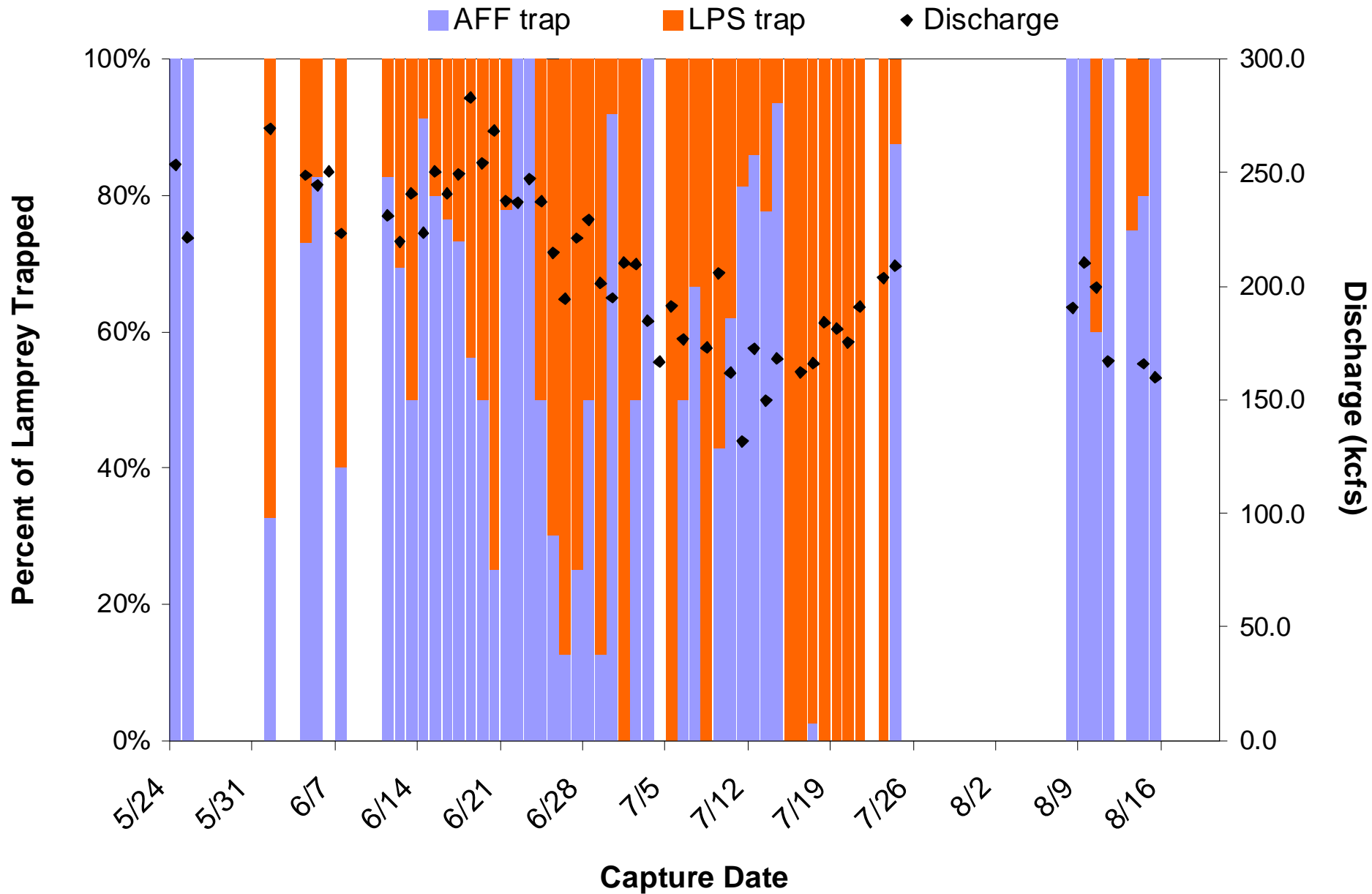
$n = 462$ total
(667 in WA ladder)

$n = 13$ PIT-tagged (2%)

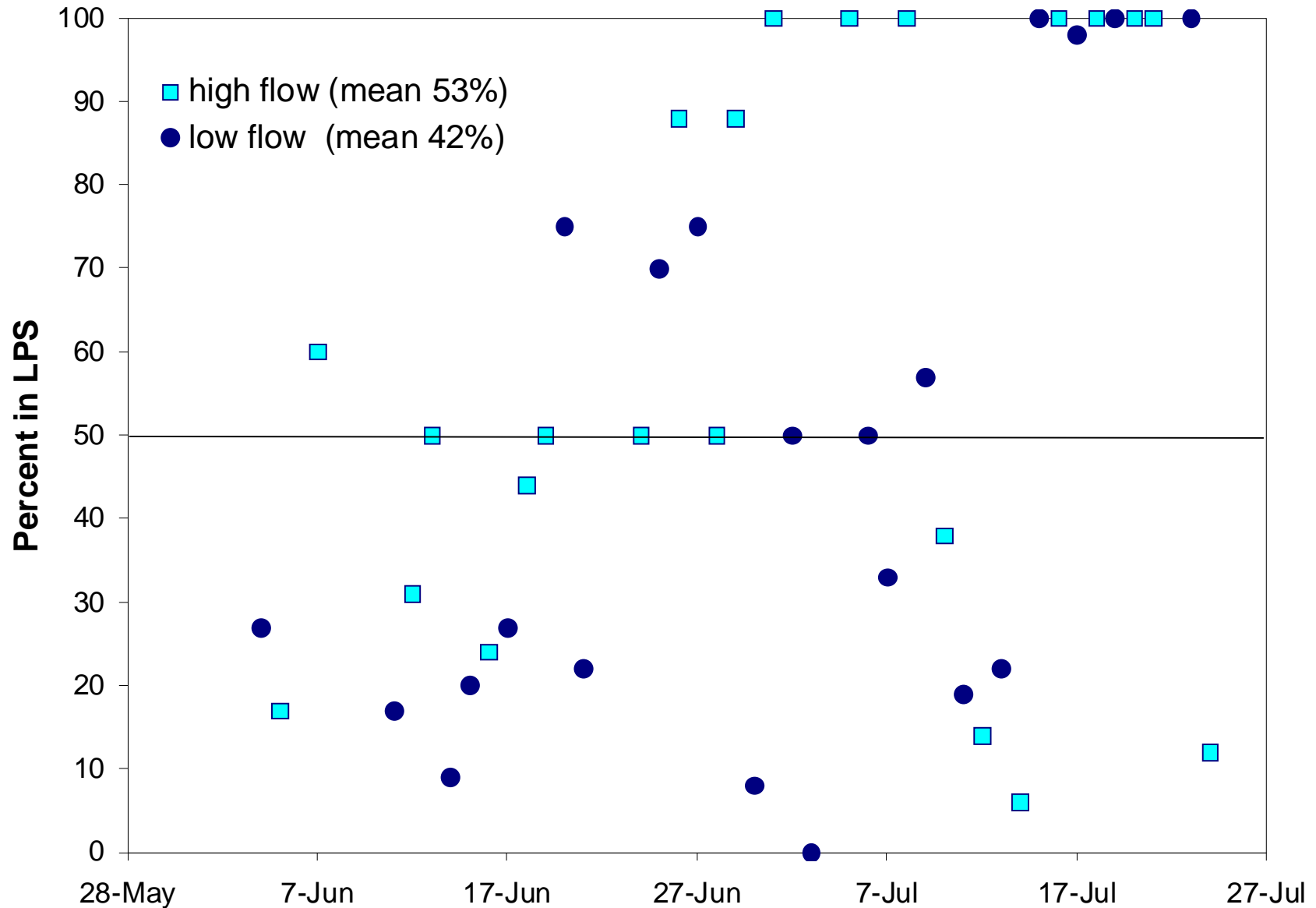
$n = 2$ radio-tagged (5%)

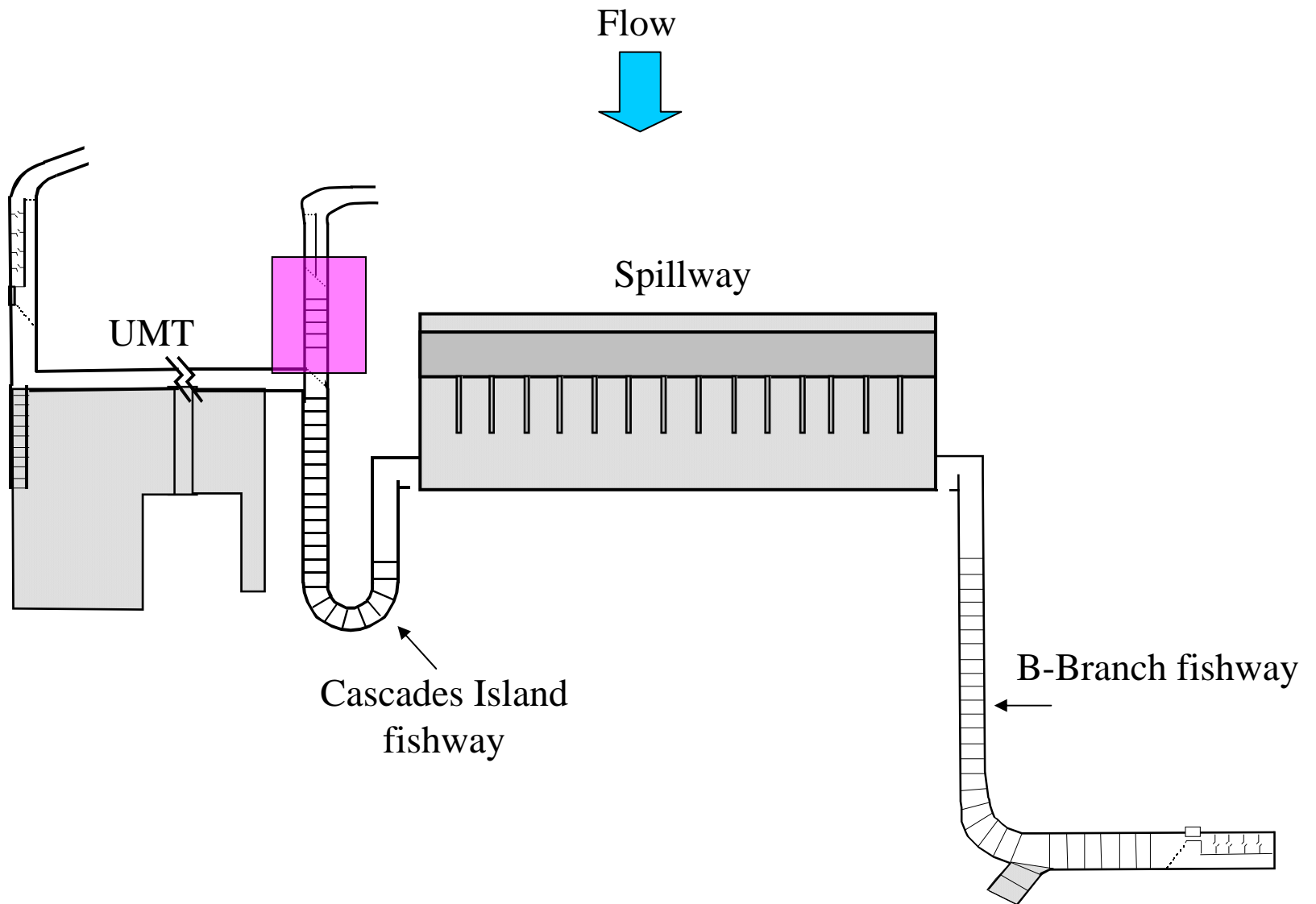


Washington Shore Fishway

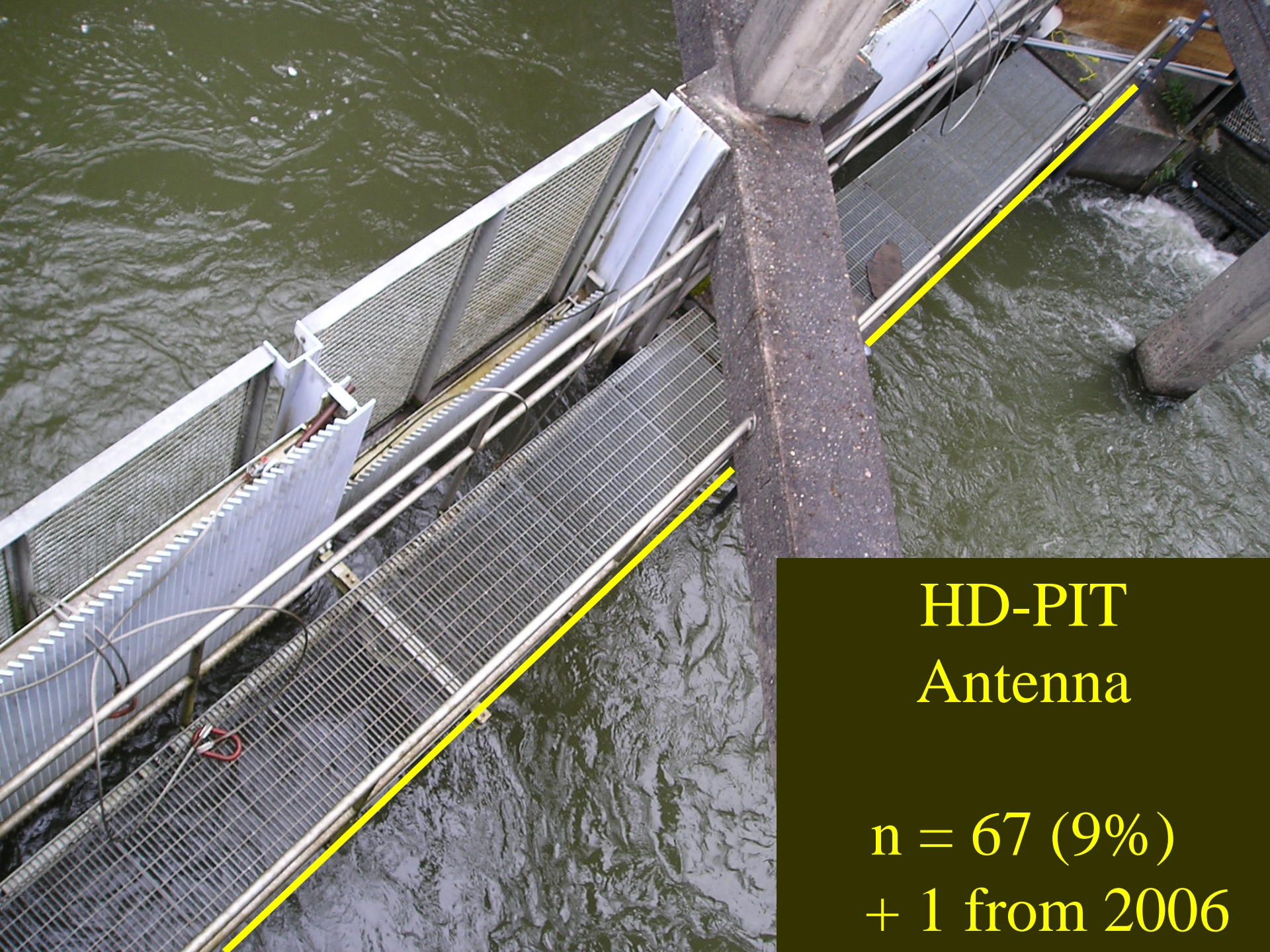


Washington-shore Entrance LPS





Bonneville Dam



HD-PIT Antenna

$n = 67$ (9%)
+ 1 from 2006

Conclusions

- Times to pass and success rates of lamprey were similar for the two AWS LPSs, in spite of design differences.
- The proportion of lamprey using the Bradford Island LPS was higher than in any previous year.
- 7% of the PIT-tagged lamprey used the two AWS LPSs.
- Absolute and relative numbers of lamprey captured at the PH2 entrance collector were higher than in previous years.
- 9% of the PIT-tagged lamprey were detected at the top of the Cascades Island fishway.



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